

Upwelling

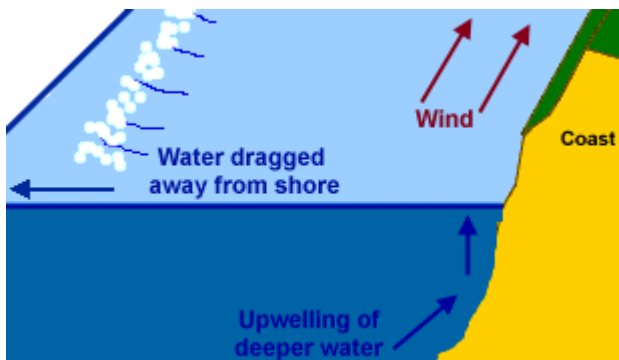
Upwelling is where wind driven forces pull surface water away causing nutrient rich deep ocean water to rise to the surface. There are many types of upwelling but the most important one to humans is coastal upwelling.

Coastal upwelling is where winds push the warm usually nutrient depleted surface water away from the coast and then nutrient rich deep sea water is forced up to the surface near the coast. This is very important because it cause the coastal waters to be nutrient rich. This causes phytoplankton to thrive and dissolve carbon dioxides with light energy. They are the bottom of the food chain, if they thrive they cause everything else to thrive too. A perfect example of this is the Peruvian coast.

The Peruvian coast is the world's most productive upwelling region. South and south east trade winds deflected off of the Andes, causing warm surface water to go to the West because of the coriolis effect. At the Peruvian coast fishermen rely on upwelling. It causes the waters to be filled with fishes that they can catch.

El Niño moves or reduces upwelling in regions that normally have upwelling. Causing local fisheries to suffer or sometimes collapse. This is because they some times over fishing or the fish migrate to another place and there isn't anymore fish in the area for them to catch. Also birds depend on the fish and their droppings help to fertilize the land.

Upwelling also occurs at the equator and can be caused by tropical cyclones. Tropical cyclones can cause upwelling by the churning of the cyclone which bring up water from below. Upwelling not only occurs in our oceans it can occur in other fluid like environments, like magma in the mantel.



To read more about upwelling look at these sites:

<http://en.wikipedia.org/wiki/Upwelling>

<http://oceanmotion.org/html/background/upwelling-and-downwelling.htm>

http://en.wikipedia.org/wiki/Ekman_transport

<http://www.science-house.org/nesdis/upwelling/background.html>

What kind of upwelling are there?

Explain Coastal upwelling and give an example of it.

Why is upwelling important to fishermen?

How does El Niño affect upwelling?